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MARKUS VALTER WITTE et al.

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For: COMMUNICATION SYSTEM FOR USE WITH A VEHICLE

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Sir:

In this patent application, the Applicant claimed foreign priority benefits under Title 35 of the United States Code Section 119 of the foreign application:

<u>Filing No.</u>	<u>Country</u>	<u>Filing Date</u>
00128302.7	EPO	December 22, 2000

Enclosed is the certified copy of the priority application EPO 00128302.7.

Respectfully submitted,

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The attached documents are exact copies of the European patent application described on the following page, as originally filed.

Les documents fixés à cette attestation sont conformes à la version initialement déposée de la demande de brevet européen spécifiée à la page suivante.

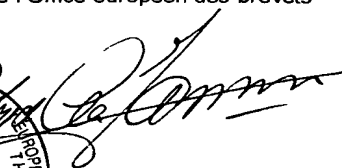
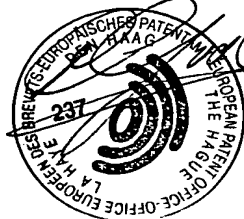
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00128302.7

Der Präsident des Europäischen Patentamts;
Im Auftrag

For the President of the European Patent Office

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Bezeichnung der Erfindung/Title of the invention/Titre de l'invention:
(Falls die Bezeichnung der Erfindung nicht angegeben ist, siehe Beschreibung.
If no title is shown please refer to the description.
Si aucun titre n'est indiqué se referer à la description.)

Communication system for use with a vehicle

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FORD GLOBAL TECHNOLOGIES, INC
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COMMUNICATION SYSTEM FOR USE WITH A VEHICLE

Technical field of the Invention

The present invention relates to a communication system for use with a vehicle.

The invention also relates to a fob unit for use in
5 such a communication system.

Background art

There are today many systems for remote locking and unlocking of vehicles on the market. Most systems comprise a handheld wireless remote control unit, also referred to as a fob, being equipped with a transmitter, for wireless transmission of a locking/ unlocking signal to a receiver unit being placed within a vehicle. A locking/unlocking signal is sent from the fob to the receiver unit by actively pushing a button on the fob when approaching/leaving the vehicle. When the receiver unit receives the locking/unlocking signal, it sends a locking/unlocking signal to the lock mechanisms in the vehicle doors, wherein the lock mechanisms are released/locked.
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However, even if such a remote key system provides for an easy access to a vehicle, it does not necessarily facilitate quick drive-away, since there are still many settings to be made, before a user comfortably and safely may start the vehicle and drive away.
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Further, many vehicles are equipped with travel computers, providing a user of the vehicle with information about for example the distance to a pre-programmed destination or information regarding the fuel level of the tank in view of previous fuel consumption. However, many users do not take full advantage of the travel computer since it may be time consuming to program the computer. A further disadvantage with this construction is that the
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editing of the settings in the travel computer must be made when the user is in the vehicle, which further delays the drive-away.

Therefore, it is a primary object of the present invention to provide a system for easy access to vehicle data from a distance.

Another object is to provide a system, in which it is possible to change vehicle settings and personal settings from a distance.

Another object of the invention is to provide a flexible system, which may be used in a variety of ways.

Summary of the invention

These and other objects are achieved by a communication system for use with a vehicle, said system comprising a first communication unit located within a vehicle, and a second portable communication unit, said first communication unit comprising a first memory circuit, connected with a first transceiver, and said second communication unit comprising a second memory circuit, connected with a second transceiver, said first and second transceivers being arranged to establish a short-distance wireless communication link between said first and second communication units when the communication units are within a communication range from each other, thereby enabling two-way communication between said first and second communication units, whereby an information item, stored in any one of said memory circuits is transmittable to the other one of said memory circuits, over said wireless communication link when the communication units are within said communication range from each other. With a communication system in accordance with the invention it is possible to transfer information between a portable unit and the vehicle automatically, without user assistance.

Preferably, said second communication unit is a portable fob. This is a practical solution, since most vehi-

cles today are equipped with a fob for remote locking/unlocking of the vehicle doors. Consequently a user of a vehicle already normally carries such a component, making the system according to the invention consumer friendly.

Suitably, said second communication unit is connect-
able to an external information source, such as a per-
sonal computer, in order to establish an information
transmission channel between said external information
10 source and said second communication unit. This enables
the user to simply add information to the fob, by for ex-
ample editing personal settings and other information at
an external source such as a PC, and thereafter load this
information into the fob, for further transfer to the
15 first communication unit of the vehicle. Thereby, there
is a reduced need for having complicated programmable
means in the fob.

In accordance with a preferred embodiment, said second communication unit is connectable with a unit for long-distance wireless communication, such as a cellular terminal, and said first communication unit is connectable with a long-distance wireless communication network, such as a cellular network, whereby a two-way connection between the first and second communication unit is established by connecting said terminal with said first communication unit over said network. This embodiment enables a user to perform an information transfer over a long distance, by use of for example a cellular telephone. This may be useful, for example in order to perform a long-distance check of the fuel level or the location of the vehicle, or in order to check if the doors of the vehicle are locked.

Suitably, said first and second communication unit each comprises an identification item, whereby a request
35 for connection from any communication unit is tested to be qualified before a connection between said communication units is enabled. This feature make it possible to

determine which communication units should be able to communicate with each other, when several units are within communication range from each other. Consequently, a second communication unit, or a fob, may be associated with a certain vehicle, providing a safe transfer of information.

In accordance with yet another embodiment of the invention, said second communication unit is integrated in a cellular terminal. This construction facilitates the use of a single unit for short-distance as well as long-distance communication.

Said first communication unit is further suitably connected with a controller area network within said vehicle. Thereby basically all features that may be measured electrically within a vehicle may be accessed in a communication system in accordance with the invention.

According to a preferred embodiment, said first communication unit is connected with a vehicle computer within said vehicle. Thereby travel information, such as route plans or desired time of arrival may easily be transferred between the second communication unit and the vehicle travel computer.

Preferably, said second communication unit further comprises a clock device, which for example may be used to set an alarm for a user, giving the user an indication about when to leave in order to reach a destination at a desired time.

Further, said second communication unit preferably comprises a biometric sensor 18, for identifying a user. This user identification may be used in order to personalise the vehicle and different vehicle settings before the user enters the vehicle. Further, said biometric sensor 18 is suitably used to classify users in order to give different users different access to the vehicle. In this way users may for example be divided into registered users, whose biometric characteristics (such as a fingerprint) are stored in the system, and non-registered us-

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ers, whose biometric characteristics are unknown to the system. Consequently, standard settings may be provided for non-registered users, while personalised settings are provided for each of said registered users. Finally, the above mentioned and other objects are achieved by a fob unit, for use in a communication system as described above.

Brief description of the drawing

10 A currently preferred embodiment of the present invention will now be described in closer detail, with reference to the accompanying drawing.

Fig 1 is a schematic view of a system in accordance with the invention.

15 Fig 2 is a block diagram of one preferred embodiment of the invention.

Fig 3 is a block diagram of another aspect of the invention.

20 Detailed description of the preferred embodiment of the invention

The embodiment of the invention, which will be described in the following, is related to an information transfer system for use with a vehicle.

25 Referring now to figure 1, the system comprises a first communication unit 1, being positioned within a vehicle 2. The first communication unit 1 comprises a first transceiver 3 for wireless communication and a first memory circuit 4. The first memory circuit 4 is connected to said first transceiver 3, in this case being a standard Bluetooth circuit. The first communication unit 1 is further connected with a vehicle travel computer 5. In this case, the first communication unit 1 is also connected with a controller area network 6 within said vehicle 2.

The system further comprises a second communication unit 7, here constituted by a portable, handheld fob

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ner integrated in said fob unit 7. When a locking/unlocking signal is sent to the vehicle for locking/unlocking the doors of the vehicle, a part of this signal is also transmitted to a trigger device (not shown) for the generation of a trigger signal. This trigger signal is thereafter transmitted to the memory units, where it triggers the execution of an information transfer operation. Further, locking/unlocking signal may be sent over the second transceiver 9, or over a separate transmission channel.

By means of said second transceiver, said fob unit may also be connected with other communication units, such as a personal computer 13, a cellular telephone 14, a hand held computer or other on market products. By establishing a two-way communication link between for example a computer 13 and the fob unit 7 (second communication unit), an information item may be transferred between the computer and the fob. This enables a user to personalise a vehicle by loading information regarding for example travel plans, personal setting, road maps etc into the fob, whereby the information item is automatically transmitted to the vehicle as soon as the fob unit and the vehicle are within communication range from each other.

By using standard transceivers, such as Bluetooth circuits, the fob may easily be adapted for use in various other applications. For example the fob unit may be programmed to function as a remote garage door opener. Further, said second transceiver 9 of the fob unit 7 may be connected with a corresponding Bluetooth transceiver 21 in a cellular terminal 14, such as a cellular telephone, via a wireless communication link 20.. By doing this, the fob may be used to establish a long-distance, secure communication between the fob and the vehicle, thereby enabling remote check and control.

An information item is stored in the second memory circuit 10 of the fob unit 7. The second transceiver 9 of

the fob unit 7 regularly sends out an identification signal. When the fob unit 7 is within a communication range from a vehicle 2 having a corresponding first transceiver 3, accepting said identification signal, a communication link 8 between the transceivers 3,9 is established. The first transceiver 3 may also send out a corresponding identification signal that must be accepted by the fob unit 7, before said communication link 8 may be established. When said communication link 8 is established, the information item that is stored in said second memory circuit 10 is transferred over the communication link 8 to the first transceiver 3 of the first communication unit 1 within the vehicle 2. Thereafter, the item is transferred from the first transceiver 3 to the first memory circuit 4 or directly to the vehicle travel computer 5 or the like.

Further, an information item stored in the first memory circuit 4 may be transferred to the fob 7 over said communication link 8, in the same manner as described above. For example, information regarding the gasoline level may be gathered in the first memory circuit 4, and transferred to the fob unit 7 and stored in the second memory circuit 10, when leaving the vehicle 2. Consequently, this information is now available for remote check-up, since it is stored in the handheld, portable fob unit 7. Further, basically any information that may be gained through the vehicle control area network 6, may be transferred to the fob unit in the above manner. It shall be understood that the system also may comprise selector means (not shown), for selection of which information items should be transferred between the fob and the first communication unit.

Further, this information transfer may be useful in travel planning. One example is given below. A user has programmed a travel plan into the vehicle travel computer 5. The vehicle travel computer 5 has information regarding the distance to the destination, the desired time of

an audio signal. This enables a user to continue to listen to the vehicle radio or cd-player when he leaves the vehicle, but maintains within a communication range from the vehicle.

5 The present invention should not be considered as being limited to the above-described embodiment, but rather includes all possible variations falling within the spirit and the scope of this invention as defined by the appended claims. Many modifications and variations of the
10 present invention will be readily apparent to those skilled in the art.

In the above, a preferred embodiment is described in which the second communication unit is comprised in a fob unit. However, it is possible to include said second communication unit in for example a cellular telephone or a portable handheld computer, reducing the number of components of the system.

The above described presently preferred embodiment of the invention utilises Bluetooth circuits as the first and second transceivers. However, it is possible to use other devices and methods to establish said two-way connection between the first communication unit in the vehicle and the second communication unit. For example, RF circuitry may be used. The communication units should then also include control circuits for the RF circuits in order to control the communication link and its establishment, on per se known manner. The corresponding control circuits are included in the Bluetooth circuit. The communication system may also comprise two or more ways of establishing said connection. As an example, a separate communication link, such as a RF communication link, may be used for the locking/unlocking signals of the vehicle door/doors, while the above described other communication link 8 is used for more extensive information transfer.

It shall be noted that the term transceiver as used in this application comprises various constructions, for example with separate receivers and transmitters.

CLAIMS

1. A communication system for use with a vehicle comprising:
- 5 a first communication unit (1), located within a vehicle (2), and a portable second communication unit (7), said first communication unit (1) comprising a first memory circuit (4) being connected with a first transceiver (3), and said second communication unit (7) comprising a second memory circuit (10), connected with a
- 10 second transceiver (9), said transceivers (3,9) being arranged to establish a short-distance wireless communication link (8) between said first and second communication units (1,7) when the communication units are within
- 15 a communication range from each other, thereby enabling two-way communication between said communication units (1,7), whereby an information item, stored in any one of said memory circuits (4,10) is transmittable to the other one of said memory circuits, over said wireless
- 20 communication link (8) when the communication units (1,7) are within said communication range from each other.
2. A communication system in accordance with claim
- 25 1, wherein said second communication unit (7) is a portable fob.
3. A communication system in accordance with claim 1 or 2, wherein said second communication unit (7) is
- 30 connectable to an external information source, such as a personal computer (13), in order to establish an information transmission link (15) between said external information source and said second communication unit (7).
- 35 4. A communication system in accordance with any one of the preceding claims, wherein said second communica-

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10. A communication system in accordance with any one of the preceding claims, wherein said second communication unit (7) further comprises a biometric sensor (18), for identifying a user.

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11. A communication system in accordance with claim 10, wherein the output of said biometric sensor (18) is used to classify users in order to give different users different access to the vehicle.

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12. A fob unit, for use in a communication system according to any one of the claims 1-11.

ABSTRACT

Further, the invention relates to a fob unit, comprising a second communication unit, for use in a communication system as described above.

Elected for publication: fig 1

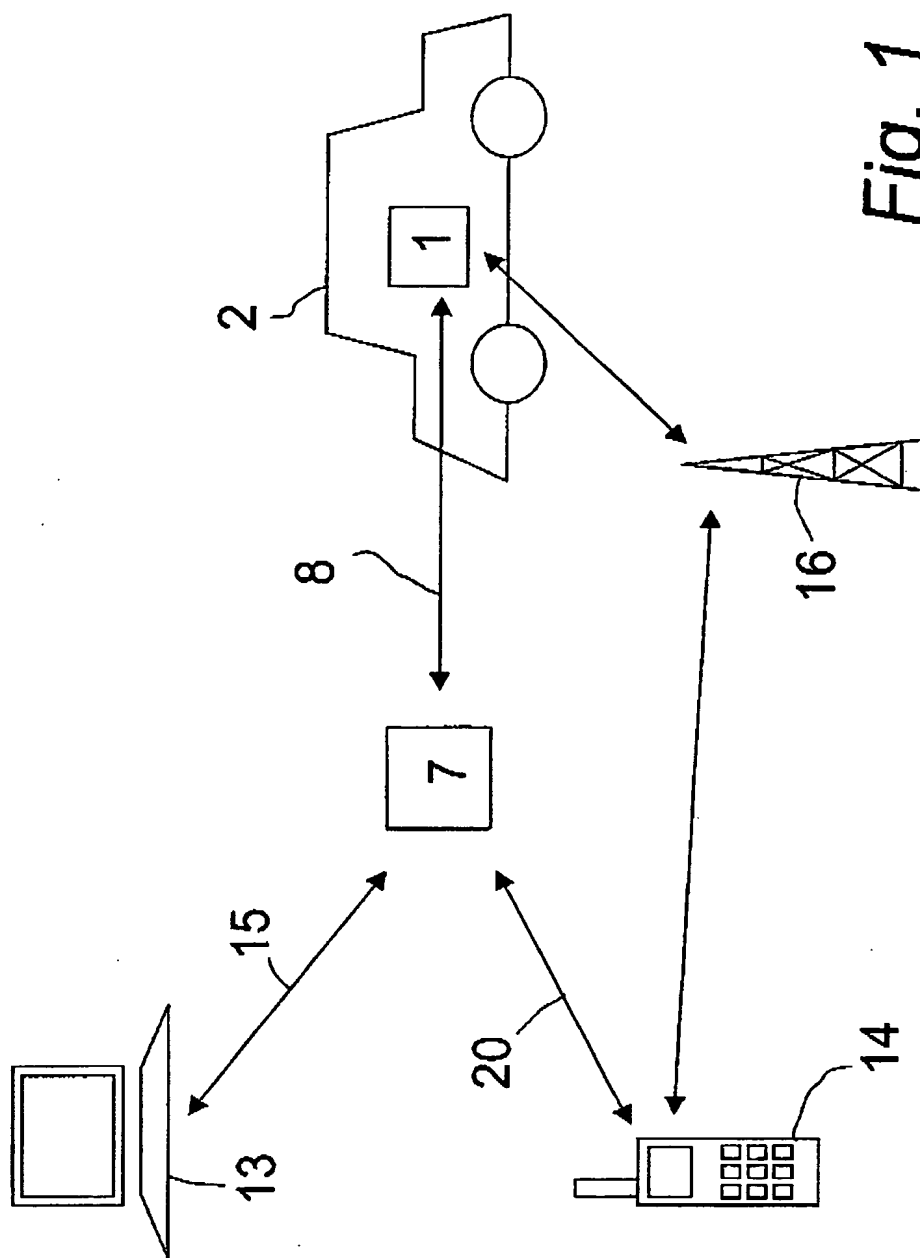
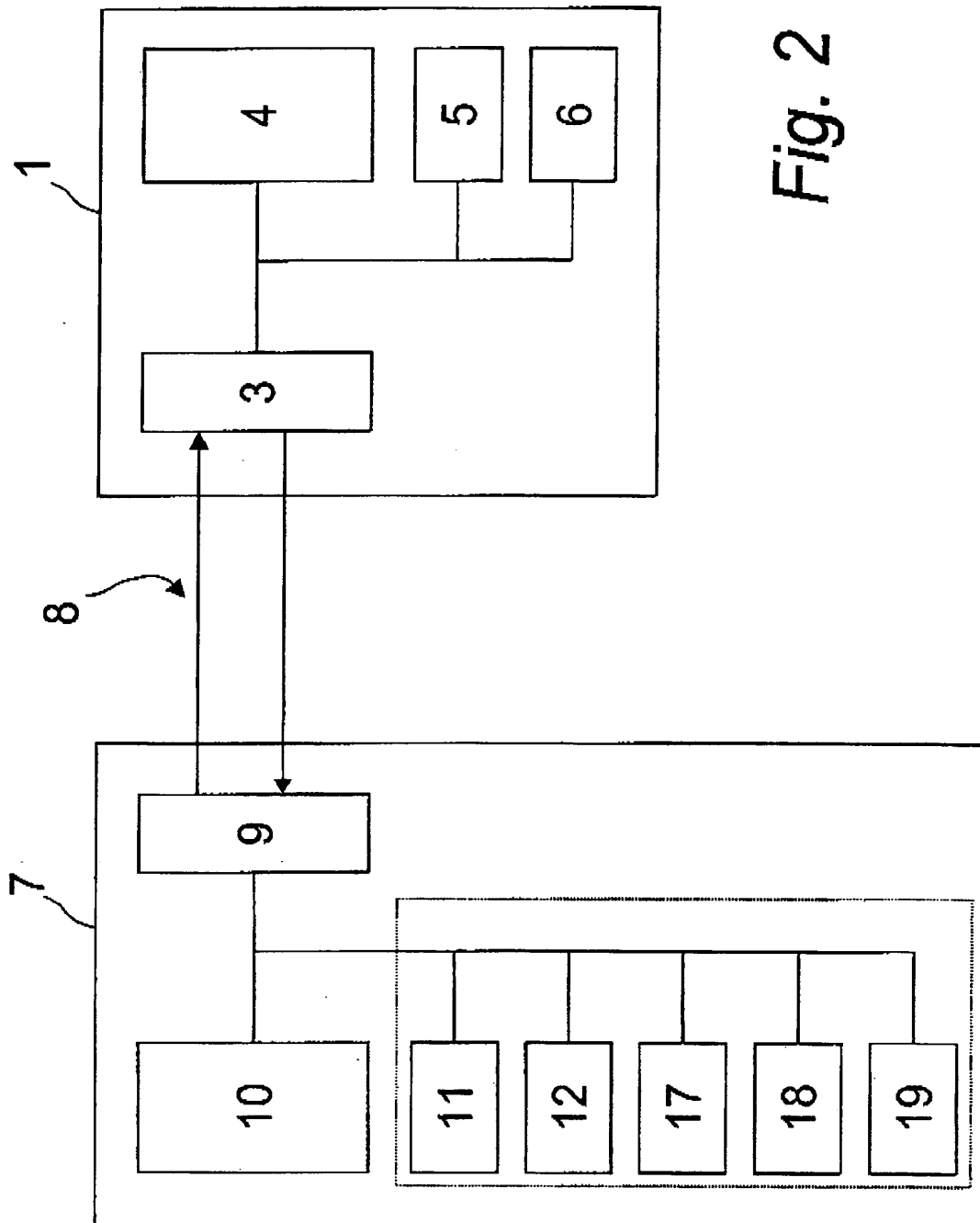


Fig. 1

*Fig. 2*

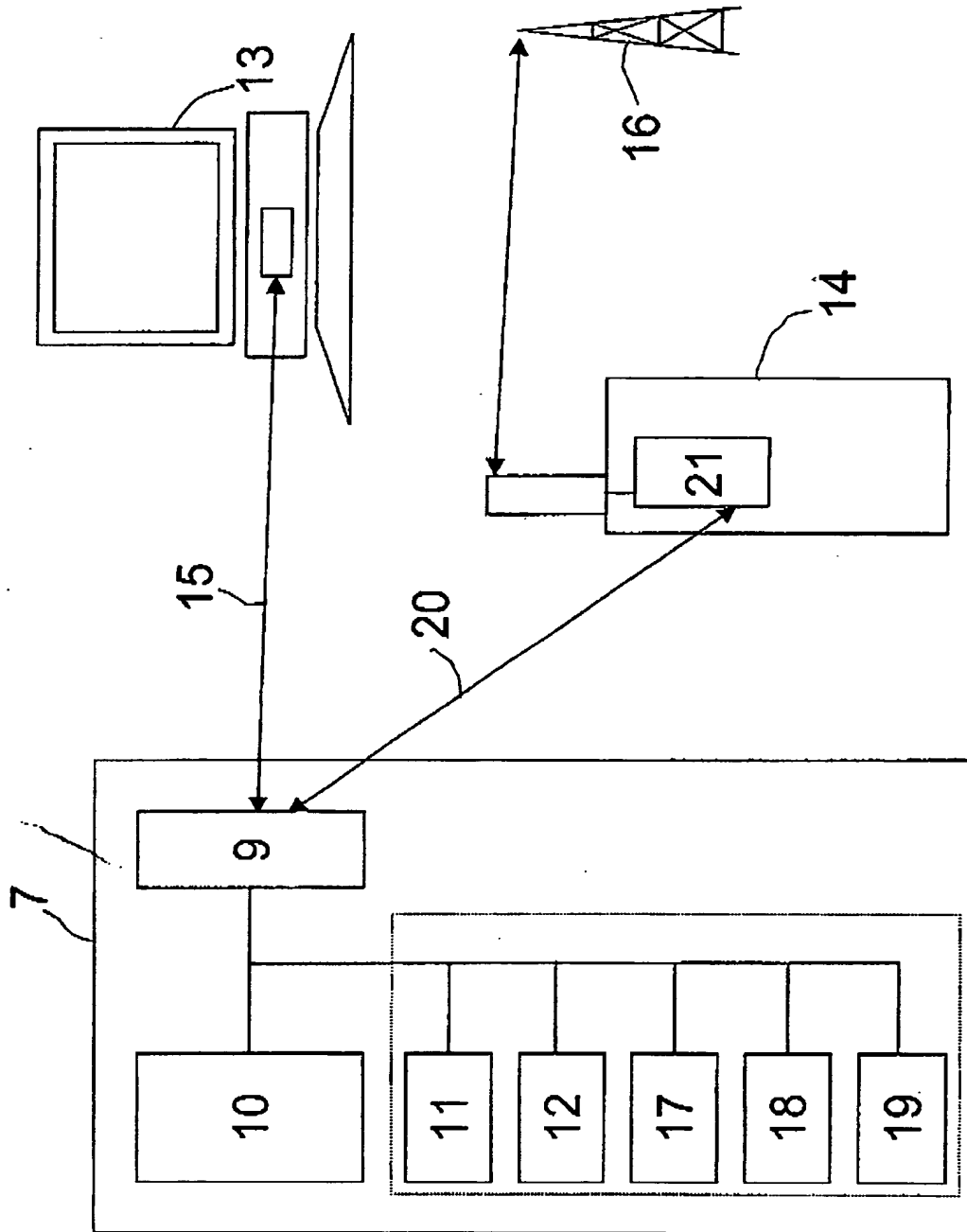


Fig. 3

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